Original Article

Quality of Life in Coronary Artery Disease: SF-36 Compared to WHOQOL-BREF

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Abstract

Background: The Short Form Health Survey (SF-36) and WHO Quality of Life-BREF (WHOQOL-BREF) questionnaires are two common tools to assess changes in quality of life (QOL) over the course of treatment, especially in patients with coronary artery disease (CAD). However, the value of these two instruments among CAD patients has not been studied and compared. The objective of the present study was; therefore, to compare the SF-36 with the WHOQOL-BREF in these patients.

Methods: Between May and September 2006, patients with a final diagnosis of CAD who were candidates for isolated coronary artery bypass grafting (CABG) and hospitalized in Tehran Heart Center were randomly divided into two groups of 268 patients (for assessment of QOL with the SF-36) and 275 patients (for assessment of QOL with the WHOQOL-BREF). The correlations between the WHOQOL-BREF domains and SF-36 subscales, in addition to those between the SF-36 components summary scores and WHOQOL-BREF domains, were examined with Pearson's correlation coefficients.

Results: The correlations between the physical, psychological, and social domains of the WHOQOL-BREF and physical functioning, mental health, and social functioning of the SF-36 were weak with Pearson's correlation coefficients of 0.015, -0.036, and 0.042, respectively ($r<0.3$). There were also poor correlations between the physical component summary of the SF-36 and physical domain of the WHOQOL-BREF ($r=0.001$), and between the mental component summary of the SF-36 and mental domain of the WHOQOL-BREF ($r=-0.082$).

Conclusion: The correlation between the two questionnaires of the SF-36 and WHOQOL-BREF in the evaluation of QOL in CAD patients is weak.

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Introduction

In clinical practice, quality of life (QOL) assessments will assist clinicians in making judgments about the areas in which a patient is most affected by disease and in making treatment decisions. In most countries, treatments aimed at improving QOL through palliative care, for example, can be both effective and inexpensive.[1]

Several instruments are available to assess changes in QOL over the course of treatment, especially in patients with coronary artery disease (CAD). The Short Form Health Survey (SF-36) questionnaire is one of the most widely generic

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health status instruments used extensively in cardiac patient populations, and some studies have investigated longitudinal changes in QOL with this questionnaire.[2-5] It includes a global evaluation of health and covers eight dimensions of health including limitations in physical functioning, usual role activities, social functioning related to health problems, and vitality.[6]

Another questionnaire widely used to assess generic health status is the WHO Quality of Life-BREF (WHOQOL-BREF) questionnaire. It defines QOL as participants' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. The recognition of the multidimensional nature of QOL in the WHOQOL-BREF is based on the four domains of physical health activities, namely daily living, psychological bodily image and appearance, social and personal relationships, and environmental-financial resources.[7]

The value of the SF-36 has been previously compared with that of other generic questionnaires in patients with CAD. Some studies have concluded that the SF-36 is the most appropriate generic instrument to assess the QOL of cardiac patients.[8] In a study by Motamed et al. in Iran, the SF-36 was reported to be an appropriate tool for assessing health perceptions of the Iranian general population with acceptable reliability and validity.[9] Additionally, a study by Nedjat et al. demonstrated good-to-excellent reliability and acceptable validity of the WHOQOL-BREF in various groups of subjects in Iran.[10]

However, the value of these two instruments among CAD patients has not been studied and compared. The objective of the present study was; therefore, to compare the SF-36 with the WHOQOL-BREF in patients with CAD.

Methods

Between May and September 2006, patients with a final diagnosis of CAD who were candidates for isolated coronary artery bypass grafting (CABG) and hospitalized in Tehran Heart Center were randomly divided into two groups of 268 patients (for assessment of QOL with the SF-36) and 275 patients (for assessment of QOL with the WHOQOL-BREF). Before the interview, the research assistants obtained a written informed consent from the participants and, thereafter, administered a computer-assisted structured questionnaire so as to obtain personal and health information. Through these interviews, QOL was measured using eight subscales and also two physical (PCS) and mental (MCS) component summary scores of the SF-36 in the first group and four domains of the WHOQOL-BREF in the second group. Our methodology necessitated transforming the domain scores of both questionnaires to a 0 to 100-point scale, with a higher score on these questionnaires indicating a better QOL. The patients' medical history and clinical manifestations were collected via interviews (by a trained nurse) and physical examinations (by a physician).

The results were reported as mean±standard deviation (SD) for the quantitative variables and percentages for the categorical variables. The two groups were compared using the Student's t-test or Mann-Whitney U test (whenever the data did not appear to be normally distributed) for the continuous variables. We calculated Pearson's correlation coefficients between the physical, psychological, and social domains of the WHOQOL-BREF and physical functioning, mental health, and social functioning of the SF-36, respectively. We also calculated these correlations between the PCS of the SF-36 and the physical domain of the WHOQOL-BREF, and between the MCS and the psychological domain of the WHOQOL-BREF so as to verify whether all correlations were positive in direction and substantial in magnitude (0.30 or higher), as recommended by Ware.[11] The data analyzer was anonymous, and data collection and processing were approved by the institutional review board of our heart center. P values of 0.05 or less were considered statistically significant. All the statistical analyses were performed using SPSS version 13 (SPSS Inc., Chicago, IL, USA)

Results

All the 543 respondents completed the QOL questionnaires. The mean age of the study population in the SF-36 and WHOQOL-BREF groups were 59.7±9.0 and 59.8±9.0 years, respectively, with the majority of the respondents in the two groups being male (Table 1).

Table1. Participants' characteristics[*]

Characteristics	ST-36 group (n=275)	WHOQOL-BREF group(n=268)
Male	73.5	73.3
Age (y)	59.7±9.0	59.8±9.0
Body mass index	27.2±4.4	26.6±4.3
Family history of CAD	44.7	46.0
Current cigarette smoking	36.7	37.5
Alcohol using	11.3	11.6
Opium using	14.2	14.9
Diabetes mellitus	42.2	42.4
Hyperlipidemia	66.2	68.0
Hypertension	48.7	49.1
Cerebrovascular accident	4.0	4.4
Peripheral vascular disease	20.4	20.3
Myocardial infarction	48.7	49.1
Previous PTCA	2.7	2.3
Functional class:		
I	33.6	33.5
II	50.7	51.3
III	15.7	15.3
Ejection fraction (%)	49.3±9.7	49.6±9.5
Euroscore	2.5±3.5	2.3±2.2
Number of coronary involvement		
One	3.7	3.6
Two	22.4	23.3
Three	73.9	73.1

[*]Data are presented as percentage or mean±SD
CAD, Coronary artery disease; PTCA, Percutaneous transluminal coronary angioplasty

Among the various sub-scales of the SF-36, the role limitation-physical and social functioning sub-scales reached the lowest and highest values, respectively. Similarly, the lowest and highest values in the WHOQOL-BREF were for the physical functioning and social functioning domains, respectively (Table 2).

Table 2. The statistical measures of the various dimensions of the SF-36 and WHOQOL-BREF questionnaires

Item	Mean	Standard Deviation	Minimum	Maximum
SF-36				
Physical functioning	65.4	24.2	5	100
Role limitation-physical	35.5	39.5	0	100
Bodily pain	72.0	31.4	0	100
General health	69.6	17.1	20	100
Vitality	69.4	22.1	10	100
Social functioning	76.5	25.2	13	100
Role limitation-emotional	62.1	40.2	0	100
Mental health	67.5	20.7	8	100
SF-36 Summary				
Physical component score	62.2	19.9	14	99
Mental component score	69.0	19.6	14	98
WHOQOL-BREF				
Physical domain	56.3	10.4	25	81
Psychological domain	58.0	11.4	13	88
Social domain	59.2	16.9	0	94
Environmental domain	56.4	14.1	6	100

The mean physical, mental, and social component scores were different between the SF-36 and the WHOQOL-BREF (P<0.001). Also, the means of the PCS and MCS domains of the SF-36 were higher than those of the physical and psychological components of the WHOQOL-BREF, respectively (P<0.001) (Table 3).

Table 3. The mean of the SF-36 subscales and WHOQOL-BREF domains

Characteristics	Score	P value
Physical functioning (SF-36)	65.4±24.2	<0.001
Physical domain (BREF)	56.3±10.4	
Mental health (SF-36)	67.5±20.7	<0.001
Psychological domain (BREF)	58.0±11.4	
Social functioning (SF-36)	76.5±25.2	<0.001
Social domain (BREF)	59.2±16.9	
Physical component score (SF-36)	62.2±19.9	<0.001
Physical domain (BREF)	56.3±10.4	
Mental component score (SF-36)	69.0±19.6	<0.001
Psychological domain (BREF)	58.0±11.4	

*Data are presented as mean±SD

The correlations between the physical, psychological, and social domains of the WHOQOL-BREF and physical functioning, mental health, and social functioning of the SF-36 were weak with Pearson's correlation coefficients of 0.015, -0.036, and 0.042, respectively (r<0.3). We also found poor correlations between the PCS of the SF-36 and the physical domain of the WHOQOL-BREF (r=0.001), and between the MCS and mental domain of the WHOQOL-BREF (r=-0.082).

Discussion

The designers of the WHOQOL-BREF believe that for epidemiological surveys, this questionnaire can allow detailed QOL data to be gathered on a particular population, facilitating the understanding of diseases and the development of treatment methods. They also believe in developing a QOL assessment that would be applicable cross-culturally.[12] Furthermore, the SF-36 was constructed to survey health status in medical outcome studies and designed for use in clinical practice and research, health policy evaluations, and general population surveys.[13] Be that as it may, it has hitherto not been clear which of these two questionnaires is appropriate and applicable among patients with CAD.

Moreover, a number of instruments have been designed to examine specifically the impact of angina, myocardial infarction, or heart failure on QOL. Examples include the Seattle Angina Questionnaire,[14] the Quality of Life after Myocardial Infarction,[15] and Minnesota Living with Heart Failure[16] questionnaires.

The agreement between the SF-36 and the WHOQOL-BREF has been examined in some studies and in different fields. Huang et al. in a national survey on 11440 persons indicated that the correlations were weak among the subscales of both instruments and concluded that the SF-36 and WHOQOL-BREF appeared to measure different constructs so that the SF-36 measured health-related QOL, while the WHOQOL-BREF measured global QOL.[17] However, in another study by Hsiung on patients with HIV infection, both the WHOQOL-BREF and the SF-36 were reliable and valid health-related QOL instruments in these patients.[18] In the present study, we found poor correlations across the subscales of the two questionnaires among CAD patients. It seems that the reliability and validity of these two questionnaires for the evaluation of QOL in patients with variant diseases may be different. The SF-36 has been used in angina, myocardial infarction, heart failure,[19] and in patients with recent myocardial infarction. It has also been demonstrated to be a sensitive tool for detecting improvement of QOL after active cardiac intervention.[20,21] Transversal studies have shown that the SF-36 is a valid and reliable instrument for detecting differences between groups defined by age, sex, socio-economic status, and clinical condition.[22] Also, in a study

among the Iranian population, the Persian version of the SF-36 performed well and the findings suggested that it was a reliable and valid measure of QOL among the general population.[23] Therefore, it can be concluded that SF-36 is an applicable tool for the evaluation of QOL in patients with CAD.

In addition, some studies on patients with heart disease have indicated that the reliability or validity of the WHOQOL-BREF for the evaluation of QOL in CAD patients is low, with a few claiming that even national QOL questionnaires have higher values than does the BREF questionnaire. The Zhao et al. study on patients with congestive heart failure showed that the Chinese QOL instrument had better criterion validity than did the WHOQOL-BREF.[24] In a population-based study in Germany, relatively low correlations were found between demographic characteristics (age and sex) and the WHOQOL-BREF domain scores.[25] Also some studies have highlighted the low reliability of the BREF questionnaire in different domains. In a study conducted in Iran, Nejat et al. reported that the reliability of this questionnaire in the domain of social functioning was lower than 70%.[26] One study in Hong Kong estimated this reliability at 59%.[27] In a study by Izutsu in Bangladesh, the reliability of this questionnaire in both physical and social domains was low and equal to 59% and 28%, respectively.[28] Also, in the World Health Organization study in 23 countries, the reliability of its social domain in 16 countries was lower than 70%.[29]

Conclusion

It seems that the WHOQOL-BREF has less application than does the SF-36 or special questionnaires for the evaluation of CAD patients. Nonetheless, more studies are needed for the determination of the reliability and validity of the WHOQOL-BREF compared with other applicable questionnaires among these patients.

Acknowledgments

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